



#12

SEQUENCE LISTING

<110> Ira Herman
Alice Welch

<120> BETA-CAP73 CONTROL OF NORMAL AND
ABNORMAL CELL MIGRATION

<130> TUI-001CP

<140> US 09/750,590

<141> 2000-12-28

<150> 60/170,182

<151> 1999-12-10

<150> 09/733,818

<151> 2000-12-08

<160> 3

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<211> 4730

<212> DNA

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<221> CDS

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gtctctctga gggctggctt tgtgagccac agtgatttgt aacttaatgc gaactaattt 360
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cga ttg atg aga gca gca gaa agg gga gat gta gaa aaa gtg tcc tca 508
Arg Leu Met Arg Ala Ala Glu Arg Gly Asp Val Glu Lys Val Ser Ser
      25                      30                      35
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atc ctt gct aaa aag gga gtc aat cca ggc aag cta gat gta gaa ggc 556
Ile Leu Ala Lys Lys Gly Val Asn Pro Gly Lys Leu Asp Val Glu Gly
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aga tct gcc ttt cat gtt gtg gcc tca aag gga aat ctt gag tgt ttg 604
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Arg Ser Ala Phe His Val Val Ala Ser Lys Gly Asn Leu Glu Cys Leu	60	65	70	
aat gcc atc ctc ata cat gga gtt gat att aca acc agt gac acc gca				652
Asn Ala Ile Leu Ile His Gly Val Asp Ile Thr Thr Ser Asp Thr Ala	75	80	85	
gga agg aat gct ctt cac ctg gct gca aag tat ggg cat gca ctg tgt				700
Gly Arg Asn Ala Leu His Leu Ala Ala Lys Tyr Gly His Ala Leu Cys	90	95	100	
cta caa aaa ctt cta cag tac aat tgt ccc act gaa cat gta gac ctg				748
Leu Gln Lys Leu Leu Gln Tyr Asn Cys Pro Thr Glu His Val Asp Leu	105	110	115	
cag gga aga act gca ctt cat gat gca gct atg gca gac tgt cct tct				796
Gln Gly Arg Thr Ala Leu His Asp Ala Ala Met Ala Asp Cys Pro Ser	120	125	130	135
agc ata cag ctg ctc tgc gac cat ggg gcc tcg gtg aat gcc aaa gat				844
Ser Ile Gln Leu Leu Cys Asp His Gly Ala Ser Val Asn Ala Lys Asp	140	145	150	
gta gat ggg cgg aca cca ctt gtt ctg gct acc cag atg tgt agg cca				892
Val Asp Gly Arg Thr Pro Leu Val Leu Ala Thr Gln Met Cys Arg Pro	155	160	165	
aca ata tgt caa ctg ctg ata gat aga ggg gcg gat att aat tcc aga				940
Thr Ile Cys Gln Leu Leu Ile Asp Arg Gly Ala Asp Ile Asn Ser Arg	170	175	180	
gac aaa caa aac agg act gct ctc atg cta gga tgc gag tat ggt tgc				988
Asp Lys Gln Asn Arg Thr Ala Leu Met Leu Gly Cys Glu Tyr Gly Cys	185	190	195	
aaa gat gca gta gaa gtc tta atc aaa aac ggc gct gac gtg acc ttg				1036
Lys Asp Ala Val Glu Val Leu Ile Lys Asn Gly Ala Asp Val Thr Leu	200	205	210	215
ctg gac gcc ctt ggc cat gac agt tct tac tat gca aga att ggt gac				1084
Leu Asp Ala Leu Gly His Asp Ser Ser Tyr Tyr Ala Arg Ile Gly Asp	220	225	230	
aat ctg gac att cta acc tta ctg aag act gca tca gaa aat tcc aac				1132
Asn Leu Asp Ile Leu Thr Leu Leu Lys Thr Ala Ser Glu Asn Ser Asn	235	240	245	
aaa ggg aga gaa ctt tgg aag aaa gga cca tct tta caa cag cga aat				1180
Lys Gly Arg Glu Leu Trp Lys Lys Gly Pro Ser Leu Gln Gln Arg Asn	250	255	260	
ttg tct cag atg cta gat gaa gta aat acg aag tca aat cag agg gag				1228
Leu Ser Gln Met Leu Asp Glu Val Asn Thr Lys Ser Asn Gln Arg Glu	265	270	275	
cat caa aac att cag gat ctg gag att gaa aat gaa gat ctg aaa gag				1276
His Gln Asn Ile Gln Asp Leu Glu Ile Glu Asn Glu Asp Leu Lys Glu				

280	285	290	295	
aga ttg aga aaa att cag caa gaa cag aga ata tta ttg gat aaa gtc				1324
Arg Leu Arg Lys Ile Gln Gln Glu Gln Arg Ile Leu Leu Asp Lys Val				
300		305	310	
aat ggt tta cag cta cag ctg aat gag gaa gta atg gtg gct gat gat				1372
Asn Gly Leu Gln Leu Gln Leu Asn Glu Glu Val Met Val Ala Asp Asp				
315		320	325	
ctg gaa agt gag aaa gaa aag ctg aag tcc ctt ttg gca gcc aaa gaa				1420
Leu Glu Ser Glu Lys Glu Lys Leu Lys Ser Leu Leu Ala Ala Lys Glu				
330		335	340	
aag cag cat gaa gaa agc cta aga act att gag gct ctg aaa agt aga				1468
Lys Gln His Glu Glu Ser Leu Arg Thr Ile Glu Ala Leu Lys Ser Arg				
345		350	355	
ttt aag tat ttt gag agt gat cat tta gga tca gga agt cat ttc agg				1516
Phe Lys Tyr Phe Glu Ser Asp His Leu Gly Ser Gly Ser His Phe Arg				
360		365	370	
aaa gaa gat atg ctt ctt aaa caa ggt caa atg tac atg aca gac tca				1564
Lys Glu Asp Met Leu Leu Lys Gln Gly Gln Met Tyr Met Thr Asp Ser				
380		385	390	
cag tgt act tcc aca ggc atg cca gtc cat atg caa agc cga tct atg				1612
Gln Cys Thr Ser Thr Gly Met Pro Val His Met Gln Ser Arg Ser Met				
395		400	405	
tta aga cca ctg gag cta gcc tta cct aat caa gcc tca tat tcg gaa				1660
Leu Arg Pro Leu Glu Leu Ala Leu Pro Asn Gln Ala Ser Tyr Ser Glu				
410		415	420	
aac gaa att tta aag aaa gaa tta gaa gca atg aga act ttc tgt gat				1708
Asn Glu Ile Leu Lys Lys Glu Leu Glu Ala Met Arg Thr Phe Cys Asp				
425		430	435	
tca gca aaa caa gac aga ctc aaa ctc caa aat gaa ctg gct cac aag				1756
Ser Ala Lys Gln Asp Arg Leu Lys Leu Gln Asn Glu Leu Ala His Lys				
440		445	450	
gtg gcg gag tgc aag gcc tta gca ttg gaa tgt gaa agg gtg aaa gag				1804
Val Ala Glu Cys Lys Ala Leu Ala Leu Glu Cys Glu Arg Val Lys Glu				
460		465	470	
gat tca gat gag cag ata aag caa cta gaa gat gcc ttg aaa gac gtg				1852
Asp Ser Asp Glu Gln Ile Lys Gln Leu Glu Asp Ala Leu Lys Asp Val				
475		480	485	
cag aag aga atg tat gag tcg gaa ggt aaa gtg aaa caa atg cag aca				1900
Gln Lys Arg Met Tyr Glu Ser Glu Gly Lys Val Lys Gln Met Gln Thr				
490		495	500	
cat ttt ctt gcc ttg aaa gag cac ctg aca agt gat gcg gcc act ggg				1948
His Phe Leu Ala Leu Lys Glu His Leu Thr Ser Asp Ala Ala Thr Gly				
505		510	515	

aac cac agg ctg atg gag gaa ctg aag gat cag ttg aaa gac atg aaa	1996
Asn His Arg Leu Met Glu Glu Leu Lys Asp Gln Leu Lys Asp Met Lys	
520 525 530 535	
gtg aaa tac gaa ggt gcg tcc gca gaa gtg ggg aaa ttg aga aac caa	2044
Val Lys Tyr Glu Gly Ala Ser Ala Glu Val Gly Lys Leu Arg Asn Gln	
540 545 550	
atc aaa caa aat gaa atg tta gtt gaa gag ttt aag aga gat gag ggc	2092
Ile Lys Gln Asn Glu Met Leu Val Glu Glu Phe Lys Arg Asp Glu Gly	
555 560 565	
aag ctg atg gaa gag aat aag cga ctg cag aag gag ttg agc atg tgt	2140
Lys Leu Met Glu Glu Asn Lys Arg Leu Gln Lys Glu Leu Ser Met Cys	
570 575 580	
gaa ctg gag cga gag aag aga gga agg aag ctc act gag atg gaa ggc	2188
Glu Leu Glu Arg Glu Lys Arg Gly Arg Lys Leu Thr Glu Met Glu Gly	
585 590 595	
cag tta aag gac ttg tca gcc aag ctg gcc ctt tct att cca gca gag	2236
Gln Leu Lys Asp Leu Ser Ala Lys Leu Ala Leu Ser Ile Pro Ala Glu	
600 605 610 615	
aaa ttt gaa aac atg aag agc ttg tta tca aat gaa ctg aac gag aag	2284
Lys Phe Glu Asn Met Lys Ser Leu Leu Ser Asn Glu Leu Asn Glu Lys	
620 625 630	
gca aaa aaa tta ata gat gtg gaa aga gaa tat gaa aga tca ctt aat	2332
Ala Lys Lys Leu Ile Asp Val Glu Arg Glu Tyr Glu Arg Ser Leu Asn	
635 640 645	
gaa act aga cca tta aag aga gaa ctt gag aat ttg aag gcc aaa ctg	2380
Glu Thr Arg Pro Leu Lys Arg Glu Leu Glu Asn Leu Lys Ala Lys Leu	
650 655 660	
gct cag cac gtc aaa cca gag gaa cat gag cag ctc aag agc aga tta	2428
Ala Gln His Val Lys Pro Glu Glu His Glu Gln Leu Lys Ser Arg Leu	
665 670 675	
gag cag aag tca gga gaa ctt ggg aag agg atc act gag tta aca tcg	2476
Glu Gln Lys Ser Gly Glu Leu Gly Lys Arg Ile Thr Glu Leu Thr Ser	
680 685 690 695	
aaa aat cag acg tta caa aag gaa atc gaa aag gtc tgc ctg gat aat	2524
Lys Asn Gln Thr Leu Gln Lys Glu Ile Glu Lys Val Cys Leu Asp Asn	
700 705 710	
aag ctc ctt aca caa caa gta aat aac tta aca act gaa atg aaa aat	2572
Lys Leu Leu Thr Gln Gln Val Asn Asn Leu Thr Thr Glu Met Lys Asn	
715 720 725	
gtc cct tta aaa gta agt gaa gaa atg aaa aag tca cat gat gta att	2620
Val Pro Leu Lys Val Ser Glu Glu Met Lys Lys Ser His Asp Val Ile	
730 735 740	

gtt gat gat ttg aat aaa aag ctt tca gat gtg aca cac aaa tat aca	2668
Val Asp Asp Leu Asn Lys Lys Leu Ser Asp Val Thr His Lys Tyr Thr	
745 750 755	
gaa aag aag ttg gaa atg gag aag ttg ctt atg gaa aat gcc agt tta	2716
Glu Lys Lys Leu Glu Met Glu Lys Leu Leu Met Glu Asn Ala Ser Leu	
760 765 770 775	
agt aaa aat gtc agc cgc ctg gaa act gtg ttc ata cct ccc gag aga	2764
Ser Lys Asn Val Ser Arg Leu Glu Thr Val Phe Ile Pro Pro Glu Arg	
780 785 790	
cac gaa aaa gaa atg atg gct ctg aaa tcc aat atc act gaa ctt aag	2812
His Glu Lys Glu Met Met Ala Leu Lys Ser Asn Ile Thr Glu Leu Lys	
795 800 805	
aag cag ctg tct gaa ctt aat aaa aaa tgt ggt gaa gac caa gag aaa	2860
Lys Gln Leu Ser Glu Leu Asn Lys Lys Cys Gly Glu Asp Gln Glu Lys	
810 815 820	
ata tat tca ctc atg tct gaa aac aat gat ttg aaa aag acc atg agt	2908
Ile Tyr Ser Leu Met Ser Glu Asn Asn Asp Leu Lys Lys Thr Met Ser	
825 830 835	
cat cag tat gtg ccc gtg aaa acc cat gaa gag att aaa act gcc ttg	2956
His Gln Tyr Val Pro Val Lys Thr His Glu Glu Ile Lys Thr Ala Leu	
840 845 850 855	
agt agc aca ttg gat aaa acc aat aga gaa tta gta gat gtg aag aag	3004
Ser Ser Thr Leu Asp Lys Thr Asn Arg Glu Leu Val Asp Val Lys Lys	
860 865 870	
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Lys Cys Glu Asp Ile Asn Gln Glu Phe Val Lys Ile Lys Asp Glu Asn	
875 880 885	
gaa ata tta aaa aga aat ctg gag aac act cag aac caa gta aaa gct	3100
Glu Ile Leu Lys Arg Asn Leu Glu Asn Thr Gln Asn Gln Val Lys Ala	
890 895 900	
gag tac atc agc cta aga gag cat gaa gaa aag atg agt ggc cta agg	3148
Glu Tyr Ile Ser Leu Arg Glu His Glu Glu Lys Met Ser Gly Leu Arg	
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aag agc atg aag aag gtc cag gac aac agc gct gaa ata ctg gct aag	3196
Lys Ser Met Lys Lys Val Gln Asp Asn Ser Ala Glu Ile Leu Ala Lys	
920 925 930 935	
tac aaa aaa agc cag gag gag att gtc acc ctg cat gag gag att gca	3244
Tyr Lys Lys Ser Gln Glu Glu Ile Val Thr Leu His Glu Glu Ile Ala	
940 945 950	
gcc cag aag aga gaa ctc gac acg ata cag gaa tgc atc aag cta aaa	3292
Ala Gln Lys Arg Glu Leu Asp Thr Ile Gln Glu Cys Ile Lys Leu Lys	
955 960 965	
tat gct ccg atc atc agc ttg gaa gag tgt gag aga aaa ttt aaa gcc	3340

Tyr Ala Pro Ile Ile Ser Leu Glu Glu Cys Glu Arg Lys Phe Lys Ala	
970 975 980	
act gag aaa gaa cta aaa gaa cag cta tcc cag cag aca cag aag tat	3388
Thr Glu Lys Glu Leu Lys Glu Gln Leu Ser Gln Gln Thr Gln Lys Tyr	
985 990 995	
aat acc agt gaa gaa gag gcc aag aag tgc aag caa gag aat gac aag	3436
Asn Thr Ser Glu Glu Glu Ala Lys Lys Cys Lys Gln Glu Asn Asp Lys	
1000 1005 1010 1015	
tta aag aag gag atc ctc act ctt cag aag gat cta aag gat aag aat	3484
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Val His Ile Glu Asn Ser Tyr Glu Thr Glu Arg Ala Leu Ser Arg Lys	
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Thr Glu Glu Leu Asn Arg Gln Leu Lys Asp Leu Leu Gln Lys Tyr Thr	
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Thr Ser Glu Ile Leu Ala Ala Gln Thr Leu Leu Gln Lys Gln His Val	
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ccg ctg gag cag gtt gag tcc ctg aaa aaa tct ctt agt ggt aca atc	3724
Pro Leu Glu Gln Val Glu Ser Leu Lys Lys Ser Leu Ser Gly Thr Ile	
1100 1105 1110	
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1130 1135 1140	
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 35 40 45
 Gly Lys Leu Asp Val Glu Gly Arg Ser Ala Phe His Val Val Ala Ser
 50 55 60
 Lys Gly Asn Leu Glu Cys Leu Asn Ala Ile Leu Ile His Gly Val Asp
 65 70 75 80
 Ile Thr Thr Ser Asp Thr Ala Gly Arg Asn Ala Leu His Leu Ala Ala
 85 90 95
 Lys Tyr Gly His Ala Leu Cys Leu Gln Lys Leu Leu Gln Tyr Asn Cys
 100 105 110
 Pro Thr Glu His Val Asp Leu Gln Gly Arg Thr Ala Leu His Asp Ala
 115 120 125
 Ala Met Ala Asp Cys Pro Ser Ser Ile Gln Leu Leu Cys Asp His Gly
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 Ala Ser Val Asn Ala Lys Asp Val Asp Gly Arg Thr Pro Leu Val Leu
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 Ala Thr Gln Met Cys Arg Pro Thr Ile Cys Gln Leu Leu Ile Asp Arg
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 Asn Gly Ala Asp Val Thr Leu Leu Asp Ala Leu Gly His Asp Ser Ser
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 Thr Ala Ser Glu Asn Ser Asn Lys Gly Arg Glu Leu Trp Lys Lys Gly
 245 250 255
 Pro Ser Leu Gln Arg Asn Leu Ser Gln Met Leu Asp Glu Val Asn
 260 265 270
 Thr Lys Ser Asn Gln Arg Glu His Gln Asn Ile Gln Asp Leu Glu Ile
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 Glu Asn Glu Asp Leu Lys Glu Arg Leu Arg Lys Ile Gln Gln Glu Gln
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 Glu Val Met Val Ala Asp Asp Leu Glu Ser Glu Lys Glu Lys Leu Lys
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 Ser Leu Leu Ala Ala Lys Glu Lys Gln His Glu Glu Ser Leu Arg Thr
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 Ile Glu Ala Leu Lys Ser Arg Phe Lys Tyr Phe Glu Ser Asp His Leu
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 Gly Ser Gly Ser His Phe Arg Lys Glu Asp Met Leu Leu Lys Gln Gly
 370 375 380
 Gln Met Tyr Met Thr Asp Ser Gln Cys Thr Ser Thr Gly Met Pro Val
 385 390 395 400
 His Met Gln Ser Arg Ser Met Leu Arg Pro Leu Glu Leu Ala Leu Pro

				405					410						415
Asn	Gln	Ala	Ser	Tyr	Ser	Glu	Asn	Glu	Ile	Leu	Lys	Lys	Glu	Leu	Glu
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Gln	Asn	Glu	Leu	Ala	His	Lys	Val	Ala	Glu	Cys	Lys	Ala	Leu	Ala	Leu
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Glu	Asp	Ala	Leu	Lys	Asp	Val	Gln	Lys	Arg	Met	Tyr	Glu	Ser	Glu	Gly
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Lys	Val	Lys	Gln	Met	Gln	Thr	His	Phe	Leu	Ala	Leu	Lys	Glu	His	Leu
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Thr	Ser	Asp	Ala	Ala	Thr	Gly	Asn	His	Arg	Leu	Met	Glu	Glu	Leu	Lys
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Glu	Phe	Lys	Arg	Asp	Glu	Gly	Lys	Leu	Met	Glu	Glu	Asn	Lys	Arg	Leu
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Gln	Lys	Glu	Leu	Ser	Met	Cys	Glu	Leu	Glu	Arg	Glu	Lys	Arg	Gly	Arg
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Lys	Leu	Thr	Glu	Met	Glu	Gly	Gln	Leu	Lys	Asp	Leu	Ser	Ala	Lys	Leu
		595					600					605			
Ala	Leu	Ser	Ile	Pro	Ala	Glu	Lys	Phe	Glu	Asn	Met	Lys	Ser	Leu	Leu
	610					615						620			
Ser	Asn	Glu	Leu	Asn	Glu	Lys	Ala	Lys	Lys	Leu	Ile	Asp	Val	Glu	Arg
625					630					635					640
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Glu	Gln	Leu	Lys	Ser	Arg	Leu	Glu	Gln	Lys	Ser	Gly	Glu	Leu	Gly	Lys
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Arg	Ile	Thr	Glu	Leu	Thr	Ser	Lys	Asn	Gln	Thr	Leu	Gln	Lys	Glu	Ile
		690				695						700			
Glu	Lys	Val	Cys	Leu	Asp	Asn	Lys	Leu	Leu	Thr	Gln	Gln	Val	Asn	Asn
705					710					715					720
Leu	Thr	Thr	Glu	Met	Lys	Asn	Val	Pro	Leu	Lys	Val	Ser	Glu	Glu	Met
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